Reconstruction of the Column Shaft*

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This document is author's final English version of the chapter published as 'Rekonstruktion des Säulenschafts', in Elisavet P. Sioumpara, *Der Asklepiostempel von Messene auf der Peloponnes. Untersuchungen zur hellenistischen Tempelarchitektur*, Athenaia 1. München: Hirmer Verlag 2011, 45–51, 266–267, 284–285.

1. Column Drums

The column drums of the Hellenistic temple of Asklepios are in two main groups at the archaeological site of Messene: the majority of the well preserved drums have been lifted back onto the temple foundations and a group of more weathered drums and small fragments is located to the south-west of the temple.[1] Only five drums have both the bottom and top surfaces well enough preserved so that their full height and both the lower and the upper diameters can be measured; three other exterior drums are sufficiently well preserved so that their taper can be measured.[2] At the site there are twelve further drums and six small fragments.[3] Excluding the very small pieces, these 20 drums constitute only a very small portion of the original material from the peristyle and porch columns. The peristyle consisted of 32 columns of up to ten drums each, and in addition both the pronaos and opisthodomos had two columns in antis, so the maximum number of temple drums can be estimated as 360; in total, less than 6% of the original material is currently preserved at the site.[4] The material of the column shafts is soft brown sandstone: since it is very easy to carve, it is an economical and quick building material to use, and with a layer of stucco it would have been also visually difficult to distinguish from more expensive materials. Without the protective layer the stone weathers very rapidly, and in addition the drums have suffered from deep ploughing when the site was still used for cultivation.

The information gathered in July 2000 and April 2005 is presented in the Catalogue of Column Drums and Drum Fragments. If the dimension abbreviation is followed by a subscript max (e.g. H_{max}), the preservation of the block did not allow taking the dimension between two preserved surfaces. However, even in the cases where the surfaces appear well preserved, some dimensions would have been significantly affected by the application of stucco over the porous sandstone: the effect in relation to diameters is discussed in detail below. The catalogue consists of a short

* I wish to thank Elisavet Sioumpara, Petros Themelis and Manolis Korres for drawing my attention to the temple documentation project and the warm welcome to participate in it; Elisavet Sioumpara and Nikolai Asimakopoulos worked at the site at the same time as I did in July 2000, and whenever needed, their assistance was close at hand. In April 2005 I was able to complete the documentation of the recently discovered drums and fragments with the help of Esko Tikkala; without the aid of Kleanthis Sidiropoulos this work would not have been possible. Richard Anderson, Petra Pakkanen and Elisavet Sioumpara have read the manuscript and given very valuable comments. I have received financial support for the project from the Finnish Archaeological Institute at Athens in 2000 and the Department of Classics at Royal Holloway, University of London in 2005. Very warm thanks are due to all these individuals and institutions.

[1] For an illustration of the relative block positions lifted on the temple foundations in July 2000 and April 2005, see the diagram at the beginning of the Catalogue of Column Drums and Drum Fragments; the reason for including the plans is to simplify comparisons of photographic records before and after the rearrangement of the blocks. In addition to the main groups, a probable pronaos/opisthodomos drum is embedded in a later wall in ΓΓ' (Z. 262); Z. 265 was discovered in April 2005 to the south of the Asklepieion just east of the Hierothysion (XVI/36) and it is not shown in the diagram.

[2] The well preserved drums are Z. 206, Z. 210, Z. 213, Z. 215 and Z. 257; in addition, Z. 205, Z. 208 and Z. 216 can be used for reconstructing the shaft taper; see Table 1.

[3] Z. 234 and Z. 235 were most probably originally from the same drum, so they are considered in the following discussions as a single unit.

[4] The peristyle comprised 6 × 12 columns; 100% × 20 / 360 ≈ 5.6%.

description of each block and the most important measurements. If possible, the principal dimensions of the block were taken using special callipers: the lengths of the arms are freely adjustable and they can be tilted to any angle so that they give a good fit to the tapering sides of the drum. The callipers are especially useful in measuring partially broken blocks.[5]

The column shaft had the standard Doric 20 flutes with sharp arrises, and the profile of the flute is in some cases very nearly an arc of a circle, though there are also clearly asymmetrical flutes.[6] On the left of Figure 1 are presented three flutes from sixth and fifth drums from the top and on the right two flutes from second drums from the top, and the proportion of flute depth divided by width varies between 0.13–0.15, but no pattern can be observed in the proportional depth of the fluting: individual variation between the flutes is greater than any systematic change depending on the height of the shaft.

The soft material used for the drums and the weathering of the surfaces does not allow observations of how the horizontal planes of the drums were treated: there could well have been a smooth contact band at the edge of the drum, but no trace of it can be currently seen.[7] The bottom and top drums of the columns must have been slightly adjusted to compensate for the curvature of the temple krepis, but no direct analysis can be made on the single preserved top drum (Z. 213): to verify the existence of the adjustments, it would be necessary to take reliable measurements on different sides of the drum, but since the bottom surface is entirely badly weathered and only one third of the top is preserved, this is not possible.[8]

The top and bottom surfaces of the drums have cuttings for an empolion[9] but there are no additional dowel holes. Due to the poor condition of the drums it is difficult to determine whether the cutting was consistently exactly in the centre of the drum, but, for example, Z. 206 had a slightly off-centred empolion. The function of the wooden empolion was to hold a centering pin to guide the next block in place when lowered with a crane, and it was not until mid fourth century BC that iron dowels started to be introduced to columns; the earliest known cases are from the Peloponnese.[10] It has been recently suggested by R. C. Anderson that a phenomenon called ‘thermal creep’ could be observed in the marble columns of the Hephaisteion at Athens: expansion and contraction of marble crystals rather than earthquakes is the likeliest explanation for the asymmetric displacement of column drums only held in their places by the wooden centering pin and the mass of the building.[11] A comparable phenomenon cannot be observed in limestone and sandstone columns, but the Greek builders did not necessarily make a distinction between the different materials. For example, at

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5 On the manufacture and use of the callipers, see Pakkanen 1998a, 17, esp. fig. 6.

6 For example, a circle with a radius of 131 mm fits almost perfectly to the flute drawn on the left of Fig. 1; the two profiles on the right of the figure are examples of asymmetrical fluting.

7 In parallel with the marginal dressing of vertical joints, the distinct smooth contact band at the drum edge is usually described as ‘anathyrosis’ (see e.g. Dinsmoor 1950, 387), but it is often questionable whether the central part of the column surface is always sunk enough to justify the use of this term (cf. Martin 1965, 198–199).

8 Based on late-fifth- and fourth-century Peloponnesian comparative material it is, however, very likely that the columns were not tilted towards the interior but vertical: the Classical temple at the Argive Heraion, the temple of Apollo at Bassai, the Tholos at Epidauros and the temple of Athena Alea at Tegea all had vertical columns, as was almost certainly also the case with the temple of Zeus at Nemea (on the Argive Heraion, see Pfaff 2003, 88–90; on the temple of Apollo, Cooper 1996, 184; on the Tholos, Roux 1961, 138, 184; on Athena Alea, Pakkanen 1998, 24–26; on the inclination of columns at Nemea, see Pakkanen 1998, 26 n. 49).

9 Width of the rectangular empolion cuttings varies between 39–58 mm, depth 83–127 mm. There is no pattern (e.g. diminution) in the size of the empolion cutting according to the height the drum in the shaft.

10 On empolia and dowels, see Martin 1965, 294–296. The mid-4th-century temple of Athena Alea at Tegea is among the earliest examples of column drums with dowels (Martin 1965, 294; see also Pakkanen 1998a, 22–27, figs. 10, 21).

11 R. C. Anderson’s talk in the International Colloquium at the Canadian Archaeological Institute at Athens, 18–20 May 2001; a publication is under preparation by the author.

Epidauros, the buildings of the first half of the fourth century employ only an empolion, but in the latter half and later, metal dowels were added to the column drums.[12] The material of the columns is fine-grained limestone, which was most likely all imported from Corinthia.[13] No certain reason for omitting the dowels at Messene can be given: it could be due to local building tradition, and certainly it saved the costs of adding expensive iron dowels.[14]

Eight drums have their full height preserved, and their range is 0.600–0.711 m. The tallest partially preserved drum has a maximum height of 0.682 m (Z. 205), so there could well have been taller drums than the currently existing ones. Based on their diameters and flute widths, the drums can be assigned to different positions in the shaft (Table 1); three drums and four fragments can be attributed to the pronaos or the opisthodomos columns based on their smaller diameters and flute widths than in the preserved exterior capital fragment (Z. 203, Z. 204, Z. 232, Z. 256, Z. 260, Z. 261 and Z. 262), though the possibility that they could have been part of another Doric building at Messene cannot be entirely excluded. Calculating from the top, the drums are from six different levels in the shaft, but there is hardly any doubt that there would have been more drums below the preserved ones. A column comprising only six drums would have had a height of approximately 4.5 lower diameters; such stocky proportions have no parallel after the fifth century.[15]

On sites which have been later used as a stone quarry different patterns of preservation can be observed, and the relatively poorer condition of lower drums is not without parallels: for example, at Tegea and Stratos the dismantling of the temple seems to have damaged especially the bottom drums. At Tegea the most probable method of pulling down the columns was to light a bonfire at the foot of a column shattering the stone on at least one side of the bottom drum.[16] At Stratos the top parts of the bottom drums are especially damaged and only a single second drum was discovered at the site or close to it. This destruction pattern could be consistent with chopping down the columns literally like trees.[17] It is also possible that after the columns had been felled, the top drums were less in harms way, being further away from the building: in order to get to the krepis blocks which were easier to use, it would have been necessary to remove all the lower drums. Another reason for the complete disappearance of the bottom drums could be an unusual Messenean habit of constructing the lower part of the shaft: the recently unearthed columns of the North Stoa in the Agora have higher drums made of sandstone, but the bottom drums have a round limestone core and the fluting is made entirely of a very thick layer of stucco.[18] If the temple did use this method for the bottom drums, there would be no distinguishing characteristics to currently link the blocks with the Asklepieion.

[12] Martin 1965, 294.
[13] Burford 1969, 169.
[14] A study on the correlation of the building material of the columns and use of doweling in Late Classical and Hellenistic building could throw more light on the use and understanding of different building materials in Greece, but it is outside the scope of this study.
[15] Shaft height: 6 × c. 0.65 m = 3.9 m; estimated capital height: 0.5 m; lower diameter (Z. 206; cf. Fig. 1): 0.98 m; proportional height of column: $4.4 / 0.98 \approx 4.5$. E.g. the temple of 'Concord' at Akragas built in the second half of the 5th c. BC has unusually heavy proportions for its period with a column of 4.7 diameters (for the data, see Mertens 1984, 108).
[16] The Tegea drums are discussed in the detail in Pakkanen 1998a, appendix A; however, the likely method of pulling down the temple is not covered in the publication.
[17] Publication of the Stratos material is under preparation by the author: for a preliminary discussion of the results of the new fieldwork, see Pakkanen 2004, and for further information on the final publication, see Table 2 n. *a*.
[18] The practice is comparable to the Roman complex masonry columns which, however, have core made of concrete and bricks instead of stone (see e.g. Adam 1994, 156–157).

Table 1. Column drum dimensions and taper. Dimensions in cols. C–E are given in meters.

Col. F: Taper of column drum (%): 100×(C–D)/E
Bold: dimension measured directly on a complete drum; taper calculated from direct measurements.
Normal: diameter calculated from radius measurement; taper calculated from radius measurements.
Italics: height of the drum incomplete, other diameter taken over a broken surface.

A. Drum	B. Position	C. Lower diam.	D. Upper diam.	E. Height	F. Taper
Z. 213	1st from top	**0.824** (±0.005)	**0.799** (±0.005)	**0.600** (±0.003)	**4.2**
Z. 208	2nd from top	**0.840** (±0.003)	*0.825* (±0.003)	*0.511* (±0.003)	*2.9*
Z. 215	2nd from top	**0.839** (±0.004)	**0.816** (±0.003)	**0.607** (±0.003)	**3.8**
Z. 257	3rd from top	**0.874** (±0.005)	**0.850** (±0.005)	**0.711** (±0.002)	**3.4**
Z. 216	3rd from top?	0.872 (±0.005)	0.844 (±0.005)	**0.617** (±0.003)	4.5
Z. 211	4th from top?	0.90 (±0.01)	0.85 (±0.01)	**0.688** (±0.002)	7.3?
Z. 205	5th from top	**0.907** (±0.003)	*0.899* (±0.003)	*0.602* (±0.003)	*1.3*
Z. 206	6th from top	**0.920** (±0.003)	**0.905** (±0.003)	**0.648** (±0.001)	**2.3**
Z. 210	6th from top	**0.917** (±0.002)	**0.900** (±0.002)	**0.689** (±0.002)	**2.5**
Z. 203	Pr./op.	**0.749** (±0.002)	*0.744* (±0.003)	*0.549* (±0.003)	*0.9*

The taper of the drum can be calculated from direct measurements for five drums (marked with bold in Table 1), and the taper of three other peristyle drums can be reasonably accurately reconstructed. Because of the stucco applied on the drums, some inconsistencies in the calculated drum tapers is expected, and the drums fall into two distinct groups: the three highest drums from the top (Z. 213, Z. 208, Z. 215, Z. 257 and Z. 216) have greater taper than the fifth and sixth drums (Z. 205, Z. 206 and Z. 210). The explanation for the difference is that the columns had entasis: the lower drums in Doric columns with entasis have gradually less taper than the higher ones, necessary to create the slightly curving shaft profile (see Fig. 3).

Traces of the original stucco can be seen on drum Z. 206 where it is c. 5 mm thick. The effect of the stucco on the diameter measurements is illustrated in Figure 2. The drawing is based on the profile of a particularly well preserved flute at the bottom of Z. 206. The flute width as measured on the drum is 147 mm (a) and its depth 22 mm (b). Assuming that the layer of stucco would have been of fairly uniform thickness, the corresponding measurements on the stucco surface would have been slightly larger, 149 mm (c) and 24 mm (d). Since the diameter measurements given in the catalogue are taken between flutes on the preserved surface, the actual drum dimensions would have been significantly greater: for a more likely diameter between the flutes, c. 10 mm should be added to the given catalogue dimension, and for the larger diameter measured between chords stretched from arris to arris (Fig. 1), c. 60 mm should be added to the diameter given in Table 1 and the catalogue.[19]

Two drums show signs of ancient repairs (Z. 206 and Z. 207). The largest repair is on Z. 206 (Fig. 2): it is nearly half the height of the drum and extends almost right across the drum with a maximum depth of almost 20 cm from the side of the drum. Even though the damage to the stone is extensive, the builders obviously did not consider it structurally significant enough for discarding the block.[20] Because of the stucco applied over the visible surfaces of the block, the repair would probably have been completely invisible.

[19] The first dimension is twice the stucco thickness, and the latter 2 × (24 + 5) = 58 mm (twice the distance from line c to measured surface in Fig. 1).
[20] The ancient quarries most probably used for quarrying the drum material are close to the sanctuary, so transport costs were not a factor in using also the inferior material in the building.

2. Comparative Material

Table 2 gives the column dimensions and proportions for a selection of Hellenistic Doric buildings: they are all peripteral or prostyle in plan and come from the Greek mainland, the Aegean islands and Pergamon; their time span is from early Hellenistic to the middle of the second century BC. The entasis data in cols. E and F are calculated by fitting a curve to the shaft profile points derived from the publications listed in the references for Table 1.[21]

In the proportional height of the column (col. G) no general trend can be observed, and the range is from 6.1 to 7.6 lower diameters. Likewise, there is no clear trend in the taper of the column shaft (col. H) with values ranging between 2.0–3.8%, though compared with Late Classical Doric architecture, the taper is less pronounced.[22] Col. I in the table gives the proportional height of the capital to the whole column height: no trend is visible and the range is fairly large, 4.7–7.2%.

In all of the five cases where it could be determined, the columns exhibited an entasis. The range of the proportional emphasis of the maximum entasis (col. J) is fairly wide, 0.11–0.23%, but it is comparable to fourth century BC buildings. The maximum entasis is approximately in the middle of the column shaft (col. K) and continuation rather than change seems to be characteristic of column entasis design in the Late Classical and Hellenistic periods.

3. Reconstruction

The preserved archaeological remains do not allow a precise reconstruction of the column shaft: this is due to both the limited number and poor state of preservation of the remaining drums. Therefore, the hypothetical reconstruction presented here is necessarily based on a combination of archaeological evidence and relevant comparative material.

The eight drums with their full height preserved have a range of 0.600–0.711 m and an average height of 0.650 m. A 95% bootstrap-*t* confidence interval for the drum height can be determined as 0.618–0.691:[23] the range is quite large and since the exact number of drums in the shaft is not known, such a large range is not helpful in determining the shaft height.

Therefore, some assumptions about the height and number of drums are necessary. Figure 3 presents a probable shaft profile with exaggerated entasis: it shows a shaft comprising ten drums with an average drum height of 0.65 m. The profile at the height between 2.6 and 6.5 m is based on the preserved archaeological material, but the line below 2.60 m it is conjectural. However, as discussed above, a symmetric shaft profile with the maximum entasis in the middle of the shaft is

[21] For the method, see Pakkanen 1997. For comparative material including Hellenistic stoas, see Pakkanen 1998b, 155–157.

[22] For Late Classical buildings, see Pakkanen 1997, esp. Table 3.

[23] For a discussion why bootstrap confidence intervals should be preferred over classical ones, see Pakkanen 1998a, 52–54; for a recent general discussion, see Baxter 2003, 147–151. The formula used to calculate the *t*-statistic was $T_B = (\bar{x}_B - \bar{x}) / (s_B / \sqrt{n})$, where $\bar{x}_B$ and s_B are calculated from each bootstrap sample; the sample mean $\bar{x}$ at Messene is 0.6500 m and the sample size $n = 8$. 5000 bootstrap values were generated, and the values limiting 95% of the distribution were $t_{\alpha/2} = 2.1635$ and the maximum $t_{1-\alpha/2} = -2.7811$. The confidence interval can be calculated using the formula

$$\bar{x} - t_{\alpha/2}\ (s/\sqrt{n}\sqrt{(N-n)/N}) < \mu < \bar{x} - t_{1-\alpha/2}\ (s/\sqrt{n}\sqrt{(N-n)/N}),$$

where as the population size N the probable number of peristyle drums, 320, was used; the sample standard deviation s is 0.041795.

typical for Late Classical and Hellenistic Doric architecture. The lower diameter of the shaft between the flutes is reconstructed as 0.96 m and larger diameter as 1.02 m. The ten drums would produce a shaft height of c. 6.5 m and a total column height of c. 7.0 m. The proportional height of approximately 7 lower diameters is also in line with the comparative material (col. G in Table 2).

Table 2. Comparative data on column dimensions and proportions. Dimensions in cols. A–F are given in meters.

A. Column height
B. Column shaft height
C. Lower diameter of the shaft at the arrises
D. Upper diameter of the shaft at the arrises
E. Maximum entasis
F. Height of maximum entasis
G. Proportional height of the column: A/C
H. Taper of column shaft (%): 100×(C–D)/B
I. Prop. height of the capital/column height (%): 100×(A–B)/A
J. Proportional emphasis of the maximum entasis (%): 100×E/B
K. Proportional position of the maximum entasis in the shaft: F/B

	A	B	C	D	E	F	G	H	I	J	K
Temple of Zeus, Stratos (late 4th c. BC)[a]											
peristyle column	7.88–93	7.37–43	1.29	1.01	–	–	6.11–6.15	3.8	6.3–6.4	–	–
pronaos column	7.25–31	6.79–85	1.191	–	0.013	3.9	6.09–6.14	–	–	0.19	0.57
Temple of Asklepios, Delos (late 4th/early 3rd c. BC)[b]	4.54–61	4.30–37	0.60	0.50	–	–	7.6–7.7	2.3	5.2–5.3	–	–
Temple of Artemis, Epidauros (late 4th/early 3rd c. BC)[c]	c. 4.2	c. 3.95	0.59	0.51	–	–	c. 7.1	c. 2.0	c. 6.0	–	–
Temple of Athena Polias, Pergamon (early 3rd c. BC)[d]	5.25	4.95	0.754	0.605	0.008	2.6	6.96	3.01	5.71	0.16	0.53
Temple of Athena Lindia, Lindos (early 3rd c. BC)[e]	5.60	5.24	0.87	0.685	–	–	6.4	3.5	6.43	–	–
Dodekatheon, Delos (early 3rd c. BC)[f]	4.62	4.37	0.69	0.566	0.005	2.2	6.7	2.8	5.41	0.11	0.51
Shrine of the Royal Cult, peristyle column, Pergamon (ca. 230 BC)[g]	4.66	4.44	0.666	0.558	0.010	2.5	7.00	2.43	4.72	0.23	0.56
Temple of Asklepios, Messene (late 3rd c. BC)[h]	7.0?	6.5?	1.0?	0.86	–	–	7?	2.3?	–	–	–
Hieron, Samothrace (mid 2nd c. BC)[i]	5.66	5.25	0.901	0.783	0.011	2.7	6.28	2.25	7.24	0.21	0.52

[a] The dimensions in cols. A–D are based on new fieldwork conducted at Stratos in 2000–1 by the Finnish Institute at Athens and directed by the author: final publication of the fieldwork is forthcoming in the series Papers and Monographs of the Finnish Institute at Athens. The column proportions are very conservative for an early Hellenistic building. However, the unusually large discrepancy between the diameter of the ninth drum and the peristyle capital (c. 10 cm) could be used to argue that the temple was originally planned one drum higher: a ten-drum reconstruction has a proportional height of 6.72–6.77 lower diameters. Even though the pronaos columns were left unfluted, provision for entasis was made. For a preliminary publication of the results of the fieldwork, see Pakkanen 2004.
[b] The dimensions in cols. A–D are from Robert 1952, 81–82, except for the column height. Statistical analysis of the building dimensions shows that the length of the foot unit employed in the building cannot be established more precisely than as 0.324–0.329 m, and not as 0.33 m as is suggested by Robert (1952, 94); therefore, the column height given as 14 feet in *ID* 500.10–11 can be reconstructed as 4.54–4.61 m. A more detailed discussion of the building design is under preparation by the author.
[c] None of the dimensions in cols. A–D are directly given by Roux (1961, 206–209, pl. 55): the lower diameter can be calculated from his column proportions; the upper diameter and capital height are based on fig. 45; the shaft consisted

of 5 drums of c. 0.78, and 6 of the original 30 drums have the full height preserved: the 95% bootstrap confidence interval for the drum height is 0.744–833 m, which gives a minimum height of 3.97 m for the column (and therefore a minimum proportional height of 6.7 lower diameters). On bootstrap confidence intervals, see note 15.

[d] Source for dimensions in cols. A–D: Bohn 1885, 11. Radt 1988, 22 and 179 dates the building to ca. 330–320 BC on historical reasons, but the traditional date in early third century is more likely (see e.g. Lawrence 1996, 155; Gruben 2001, 464).

[e] Source for dimensions in cols. A–D: Dyggve 1960, 87, 110.

[f] Source for dimensions in cols. A–D: Will 1955, 26–28 and Pakkanen 2000, 209–211. For the date, see Will 1955, 167–177; for the entasis, see Pakkanen 2000, 209–215.

[g] Source for dimensions in cols. A–D: Boehringer & Krauss 1937, 60–64, figs. 7, 13. For the date, see Radt 1988, 275.

[h] For the date, see Themelis 1998, 17.

[i] Source for dimensions in cols. A–D: Lehmann 1969, 96–97 and pl. 114 (central column). For the date, see Lehmann 1969, 234. The entasis measurements and proportions are calculated from the second column from the left in fig. 445 (shaft height 5.27 m). This column is thicker than the central columns, but its shaft profile is the most consistent of the five reconstructed columns.

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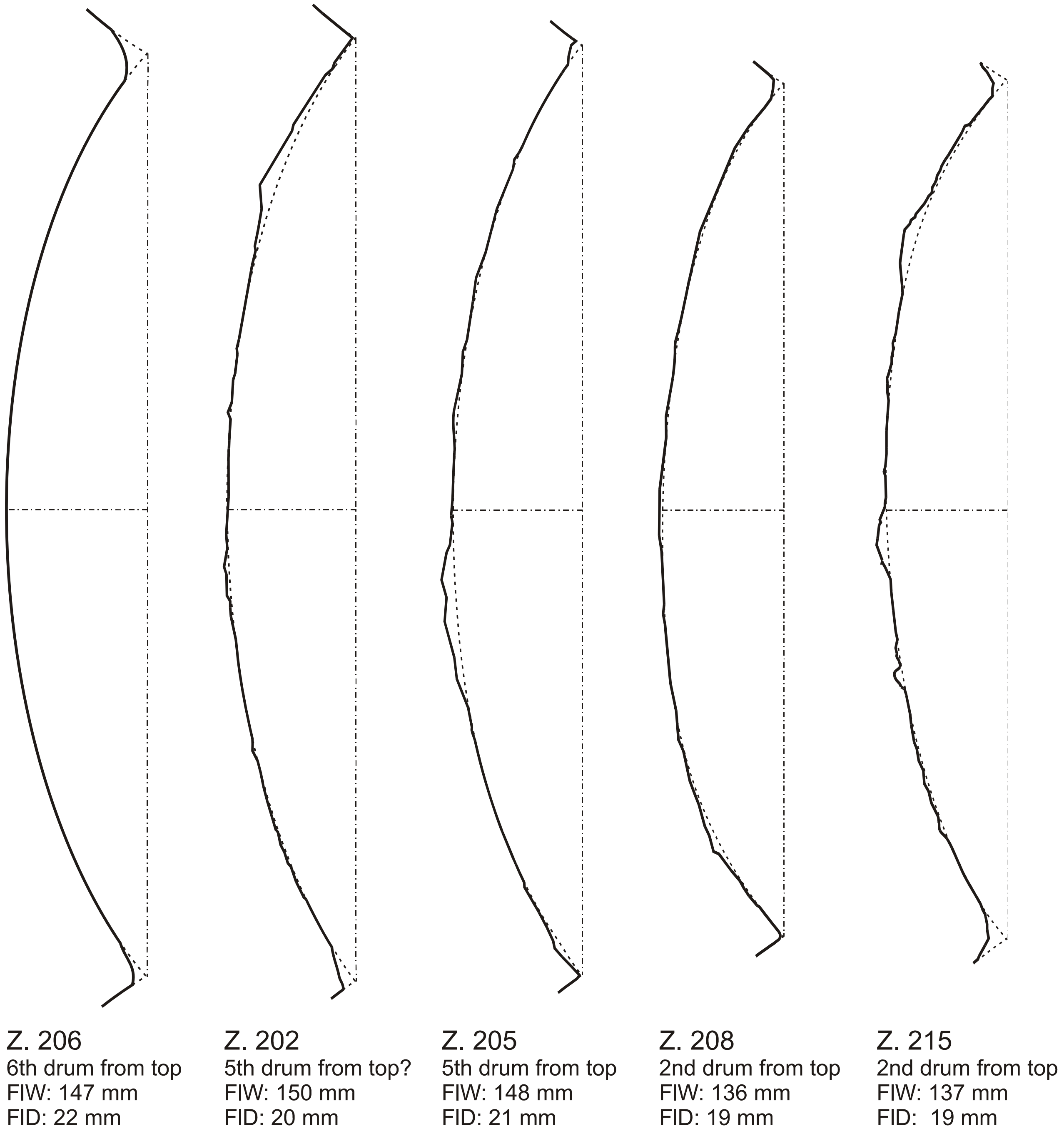

Fig. 2. Flute profiles. Scale 1:1. Drawing by J.P.

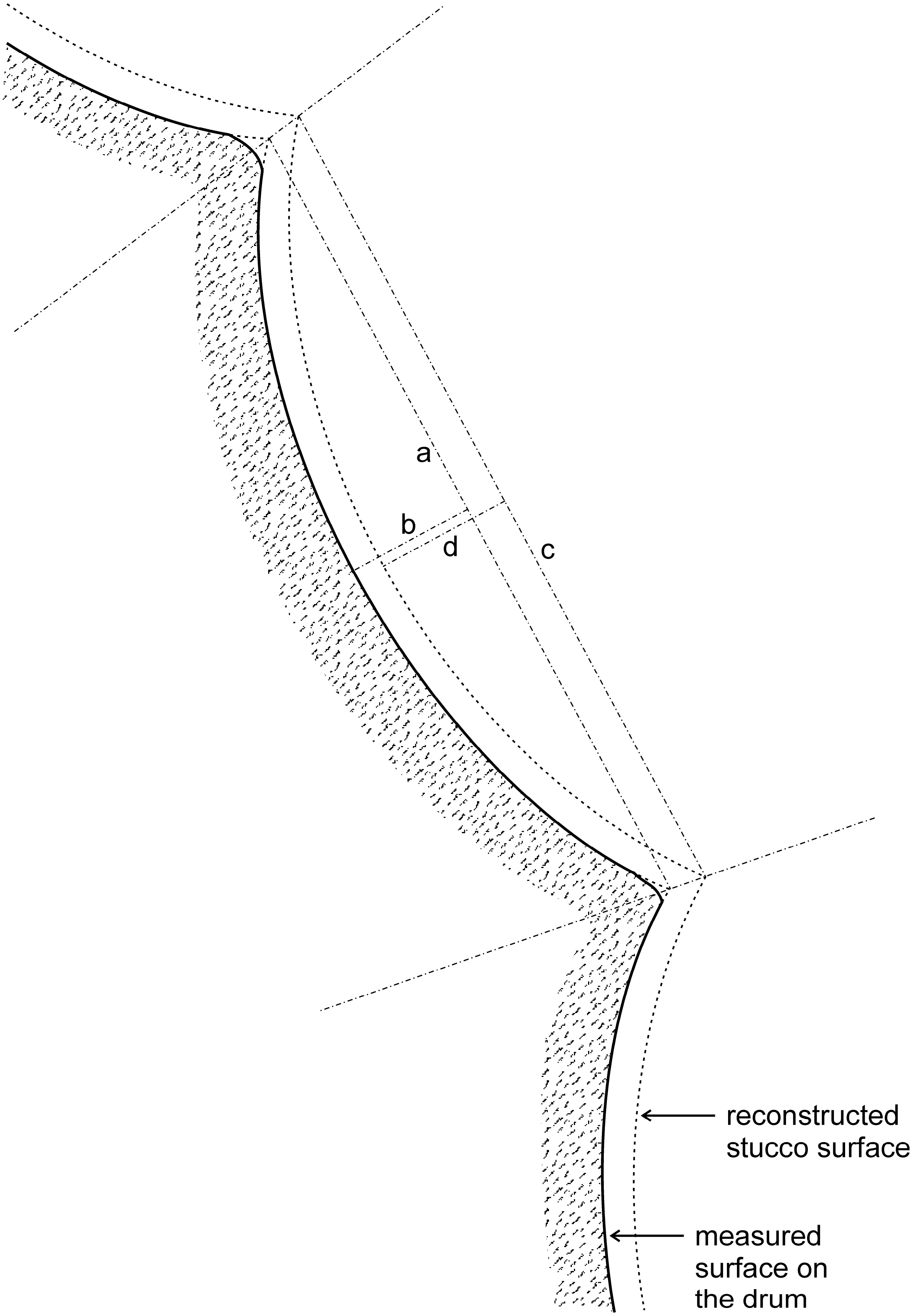

Fig. 1. Flute profile and effect of stucco on diameter measurements. Scale 1:1. Drawing by J.P.

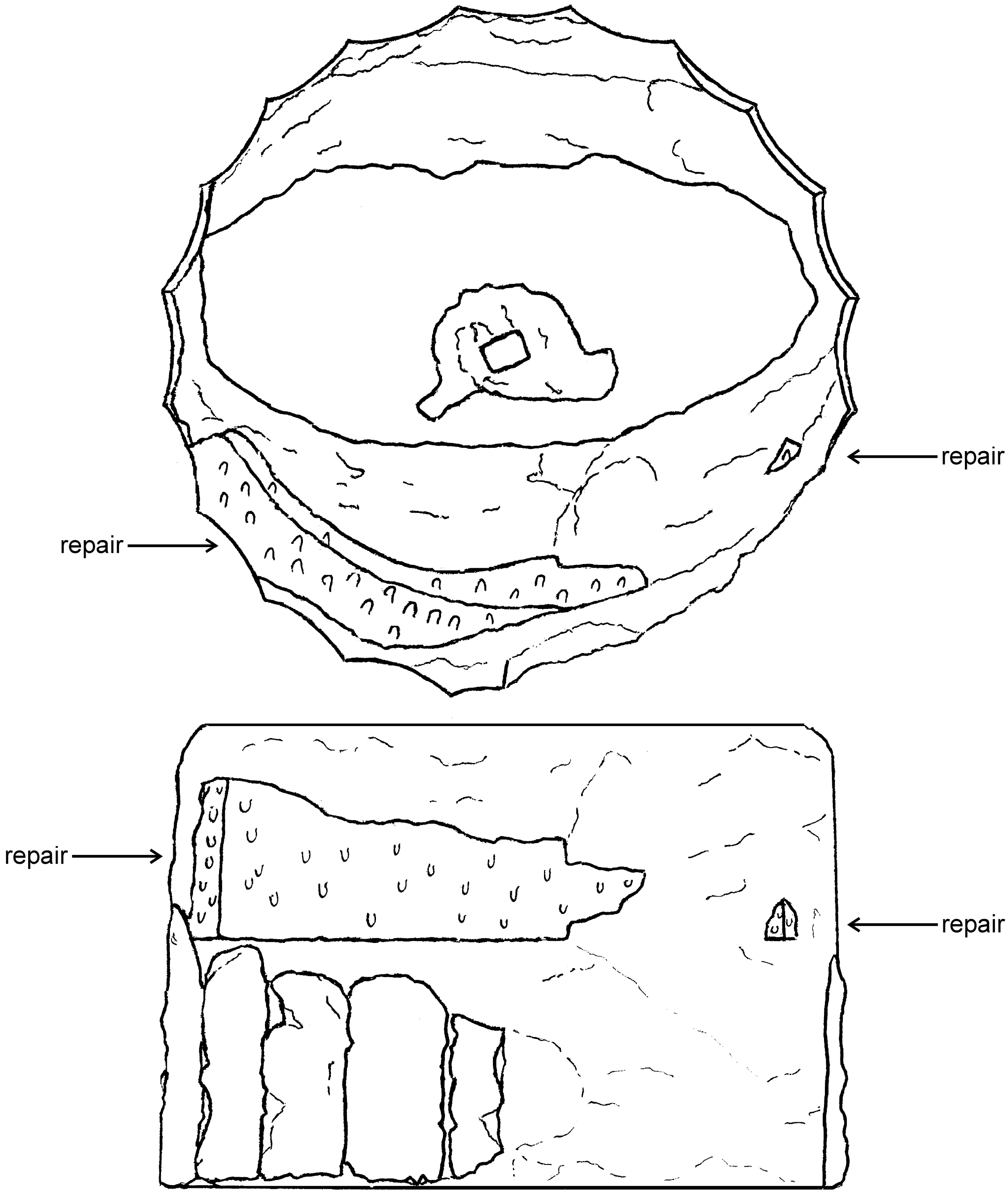

Fig. 3. Top surface and side elevation of drum Z. 206 with ancient repairs.
For dimensions, see the catalogue. Scale 1:10. Drawing by J.P.

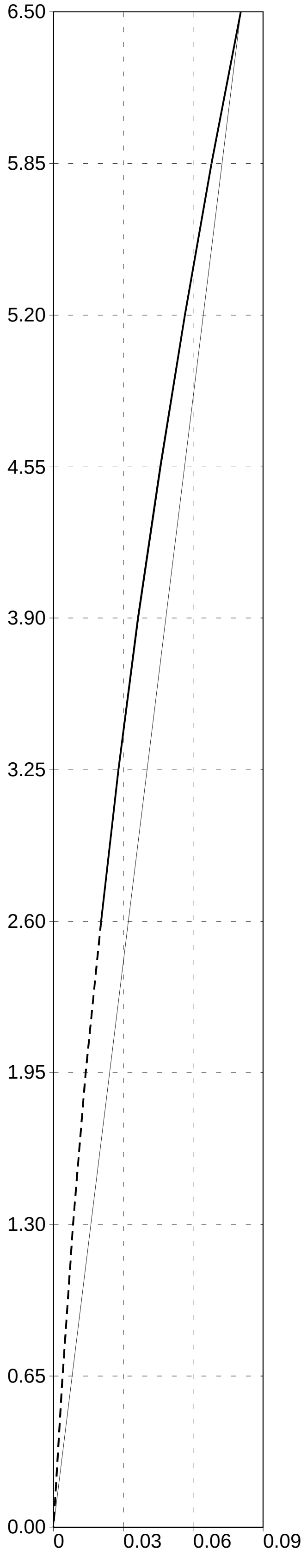

Fig. 4. Hypothetical shaft profile. *X* axis scale 1:3, *y* axis scale 1:30. Drawing by J.P.

Catalogue of Column Drums and Drum Fragments

Jari Pakkanen

All listed dimensions are given in metres.

Abbreviations

D	Depth
$Diam_L$	Lower diameter of a drum between the flutes
$Diam_U$	Upper diameter of a drum between the flutes
FlW	Flute width
H	Height
L	Length
max	Maximum preserved dimension
r	Radius
Z	Designates classified blocks from the temple of Asklepios
W	Width

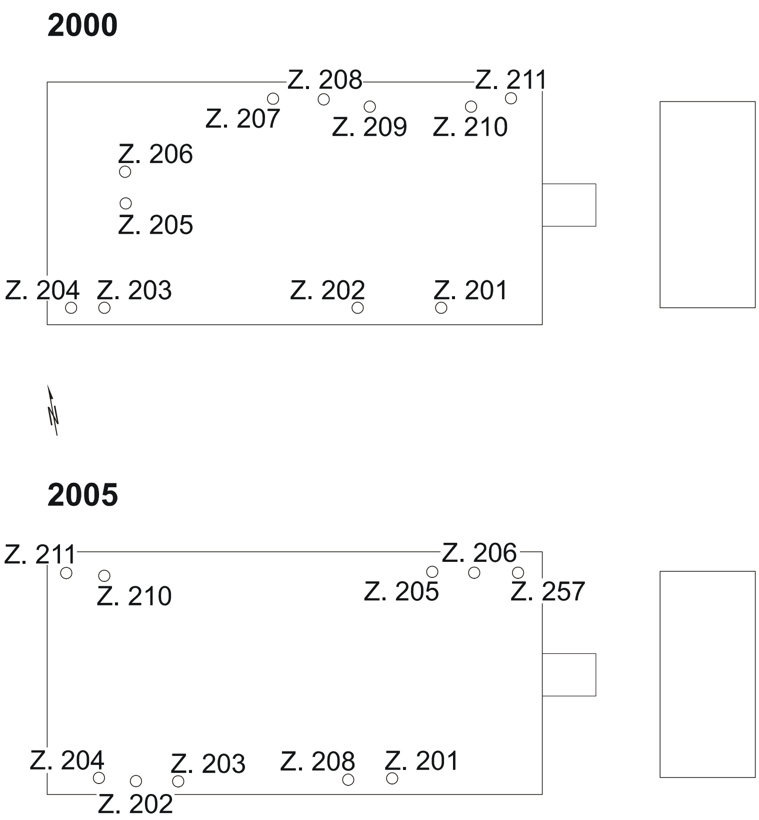

Diagram of relative drum positions lifted on temple foundations in July 2000 and April 2005.

Z. 201. From a peristyle column. Position: 6th drum from top. Top surface c. 3/4 preserved, bottom surface very probably completely broken. 9 flutes. Empolion cutting preserved on top surface (0.052 × 0.047; D: 0.119). H_{max}: 0.677; r_U: 0.450–0.453 (6 measurements); $Diam_U$: 0.904 ± 0.003 (calculated from radii); FlW: 0.149–152 (at 0.35 from top surface, 4 measurements); FlD_{max}: 0.019.

Z. 202. From a peristyle column. Position: 5th drum from top? Bottom surface c. 9/10 preserved, top surface c. 1/10. 9 flutes. Empolion cutting preserved on both surfaces (bottom: 0.048 × 0.045; D: 0.127; top: 0.046 × 0.041; D: 0.080). H: 0.640; r_L: 0.448–0.450 (7 measurements); $Diam_L$: 0.898 ± 0.002 (calculated from radii); FlW: 0.145–154 (at 0.03 from bottom surface, 5 measurements).

Z. 203. From a pronaos/opisthodomos column. Bottom surface complete, top surface completely broken. 20 flutes. Empolion cutting preserved on bottom surface. H_{max}: 0.549; $Diam_L$: 0.749 ± 0.002 (2 measurements); $Diam_U$: 0.744 ± 0.003 (at 0.549 from bottom); FlW: 0.125 (at 0.13 from bottom surface).

Z. 204. From a pronaos/opisthodomos column. Top surface c. 9/10 preserved, bottom surface completely broken. 17 flutes. Empolion cutting preserved on top surface. H_{max}: 0.349; $Diam_U$: 0.748 ± 0.002; FlW: 0.123–125 (3 measurements); FlD_{max}: 0.023.

Z. 205. From a peristyle column. Position: 5th drum from top. Bottom surface apparently well preserved, top surface completely broken. 9 flutes. H_{max}: 0.682; $Diam_L$: 0.907 ± 0.003; $Diam_U$: 0.899 ± 0.003 (at 0.602 from bottom); FlW: 0.148–152 (at 0.10–12 from bottom surface, 10 measurements).

Z. 206. From a peristyle column. Position: 6th drum from top. Bottom surface c. 1/2 preserved, top surface nearly complete (currently against the ground). Clear traces of ancient repairs. A small patch of stucco partially preserved on a currently NE facing flute (thickness 0.005). 17 flutes. Empolion cuttings preserved on both surfaces (bottom: 0.042 × 0.058; D: 0.083). H: 0.647–648 (2 measurements); $Diam_L$: 0.920 ± 0.003; $Diam_U$: 0.905 ± 0.003; FlW: 0.148–156 (6 measurements); FlD_{max}: 0.020.

Z. 207. From a peristyle column. Position: 2nd drum from top. Top and bottom surfaces completely broken. Ancient repair on west side of the drum. 10 + 2 flutes. H_{max}: 0.602; Diam: 0.828 ± 0.004 (taken approximately over the centre of preserved height); FlW: 0.147 (apparently wider than other flutes, but they cannot be accurately measured because of badly broken arrises).

Z. 208. From a peristyle column. Position: 2nd drum from top. Bottom surface nearly complete (against euthynteria), top surface completely broken. 20 flutes. H_{max}: 0.597; $Diam_L$: 0.840 ± 0.003; $Diam_U$: 0.825 ± 0.003 (at 0.511 from bottom); FlW: 0.136–0.145 (8 measurements).

Z. 209. From a peristyle column. Position: 3rd drum from top? One surface c. 1/2 preserved (against euthynteria), other completely broken. 10 flutes. H_{max}: 0.364; Diam: 0.864 ± 0.005 (at 0.345 from preserved surface; tenth flute not completely preserved, so measurement not entirely reliable); FlW: 0.138–0.155 (9 measurements).

Z. 210. From a peristyle column. Position: 6th drum from top. Bottom surface c. 3/4 preserved, top surface badly weathered. 10 flutes. Empolion cuttings preserved on both surfaces (top: W: 0.048; D: 0.127; bottom: D: 0.124). H: 0.689; $Diam_L$: 0.917 ± 0.002; $Diam_U$: 0.900 ± 0.002; FlW_U: 0.149.

Z. 211. From a peristyle column. Position: 3rd, 4th or 5th drum from top (position not possible to determine more precisely due to large error margins in the diameter measurements). Top surface c. 1/3 preserved, bottom surface c. 2/3 preserved. 9 flutes. Empolion cuttings preserved on both surfaces (top: 0.051 × 0.050; D: 0.135; bottom: D: 0.121). H: 0.688; r_L: 0.45; $Diam_L$: 0.90 ± 0.01 (calculated from radii); r_U: 0.425 (2 measurements); $Diam_U$: 0.85 ± 0.01 (calculated from radii); FlW_U: 0.147.

Z. 212. From a peristyle column. Position: 5th drum from top. Bottom surface fragmentarily preserved, top surface completely broken. 8 flutes. Empolion cutting preserved on bottom surface (0.042 × 0.052; D: 0.127). H_{max}: 0.458; r_L: 0.451–0.454 (2 measurements); $Diam_L$: 0.906 ± 0.004 (calculated from radii); FlW: 0.150 (2 measurements).

Z. 213. From a peristyle column. Position: top drum. Bottom surface partially preserved (though very weathered), top surface c. 1/3 preserved. 12 flutes. Empolion cuttings preserved on both surfaces (bottom: 0.042 × 0.052; D: 0.127; top: 0.052 × 0.050; D: 0.101). H: 0.600; $Diam_L$: 0.824 ± 0.005; $Diam_U$: 0.799 ± 0.005; FlW_U: 0.132–0.135 (3 measurements).

Z. 214. From a peristyle column. Position: 4th drum from top? Bottom surface c. 1/3 preserved, top surface completely broken. 6+5 flutes. Empolion cutting preserved on bottom surface (0.041 × 0.044; D: 0.121). H_{max}: 0.459; $Diam_L$: 0.880 ± 0.003; FlW: 0.145–147 (2 measurements).

Z. 215. From a peristyle column. Position: 2nd drum from top. Top surface c. 1/3 preserved, bottom very fragmentarily preserved (full drum height possible to measure). 12 flutes. Empolion cutting preserved on top surface (0.039 × 0.041; D: 0.095). H: 0.607; $Diam_L$: 0.839 ± 0.004 (at 0.60 from preserved top surface); $Diam_U$: 0.816 ± 0.003; FlW: 0.135–0.140 (4 measurements).

Z. 216. From a peristyle column. Position: 3rd from top? Top surface c. 1/2 preserved but very weathered, bottom surface badly damaged. 3+3 flutes. Empolion cuttings preserved on both surfaces (top: 0.049 × 0.050; D: 0.101; bottom: 0.048 × 0.050; D: 0.085). H: 0.617; r_L: 0.436; $Diam_L$: 0.872 ± 0.005 (calculated from radius); r_U: 0.422; $Diam_U$: 0.844 ± 0.005 (calculated from radius); FlW: 0.144.

Z. 232. Small drum fragment. Based on flute width most likely from a pronaos/opisthodomos column. Small part of bottom surface preserved. 4 flutes. H_{max}: 0.318; W_{max}: 0.382; FlW: 0.129–130 (2 measurements).

Z. 233. Small drum fragment. Based on flute width from a peristyle column. Small part of top surface preserved. 3 flutes. H_{max}: 0.271; W_{max}: 0.355; FlW: 0.152.

Z. 234. Drum fragment. Based on flute width from a peristyle column; could possibly be part of the same drum as Z. 235 (based on flute width and similar surface texture). Small part of bottom surface preserved. 5 flutes. H_{max}: 0.414; max. preserved radius dimension towards the centre from arris: 0.42. FlW: 0.144–0.146 (2 measurements); FlD_{max}: 0.018–0.021 (both well preserved; at 0.17 from bottom).

Z. 235. Drum fragment. Based on flute width from a peristyle column. Broken into two separate joining fragments with the smaller part with a part of the bottom surface preserved; could possibly be part of the same drum as Z. 234 (based on flute width and surface texture). Small part of bottom surface preserved. 3 flutes. H_{max}: 0.646 (measured over joint two pieces). FlW: 0.146; FlD_{max}: 0.017 (at 0.35 from bottom).

Z. 256. Drum fragment. Based on flute width most likely from a pronaos/opisthodomos column. The top surface c. 1/3 preserved with an empolion cutting (0.044 × 0.058; D: 0.088). 6 flutes. H_{max}: 0.284; max. preserved radius dimension towards the centre from arris: 0.49. FlW: 0.11 (badly weathered); FlD_{max}: 0.018–0.021 (both well preserved; at 0.17 from bottom).

Z. 257. From a peristyle column. Position: 3rd drum from top. Top surface c. 4/5 preserved, bottom surface probably c. 9/10 preserved. 20 flutes. Empolion cutting preserved on top surface, bottom not visible (0.050 × 0.061; D: 0.117). H: 0.711 (2 measurements); $Diam_L$: 0.874 ± 0.005 (1 measurement); $Diam_U$: 0.850 ± 0.005 (based on 1 measurement of the taper of the drum); FlW: 0.140 (at 0.194 from bottom); FlD_{max}: 0.018 (at 0.194 from bottom).

Z. 259. Small drum fragment. No preserved bottom or top surfaces or even full flute width; 2 flutes partially preserved. H_{max}: 0.408; max. preserved radius dimension towards the centre from arris: 0.175.

Z. 260. Small drum fragment. Based on flute width most likely from a pronaos/opisthodomos column. No preserved bottom or top surfaces. 3 flutes. H_{max}: 0.264; max. preserved radius dimension towards the centre from arris: 0.34. FlW: 0.124; FlD_{max}: 0.016.

Z. 261. Small drum fragment. Based on flute width most likely from a pronaos/opisthodomos column. No preserved bottom or top surfaces. 3 flutes. H_{max}: 0.288; max. preserved radius dimension towards the centre from arris: 0.16. FlW: 0.125.

Z. 262. From a pronaos/opisthodomos column. Reused in a later wall in XVI/2 ΓΓ'. Top surface c. 3/5 preserved, bottom surface completely broken. 3 + 2 flutes. Empolion cutting preserved on top surface (0.043 × 0.045; D: 0.055). H_{max}: 0.367; $Diam_U$: 0.757 ± 0.002; FlW: 0.122 (1 measurements); FlD_{max}: 0.015.

Z. 265. From a peristyle column. Position: 6th drum from top. Drum discovered in April 2005 east of the Hierothysion (XVI/36). Bottom surface c. 4/5 preserved, top surface completely broken. Recut into roughly rectangular shape, some sections of the sides completely missing: 3 + 1 + 4 + 3 flutes. Later recutting makes the empolion cutting much larger, but the original bottom dimensions can be measured (0.050 × 0.053; D: 0.076). H_{max}: 0.492; $Diam_L$: 0.906 ± 0.004; FlW: 0.149.